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Phyllium bankae sp. nov., a new species from Mount Ibu, Indonesia (Phasmatodea: Phylliidae)

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bankae;
Leaf insects;
walking leaf;
Taxonomy;
description;
new species;
Halmahera Island;
Indonesia.

Abstract. – With a majority of described leaf insect (Phylliidae: Phasmatodea) species having been sequenced and included in DNA based phylogenies, including many holotypes, species' geographic distributions are being revealed with greater clarity. These recent advances have revealed that some species can be wide-ranging, e.g., occurring on multiple islands of the Philippines or across hundreds of kilometers in Thailand, Laos, and Malaysia. On the contrary, some species have been found to be rather endemic, found only on single islands (like many species in Indonesia) or found only on singular mountains (like in southern Vietnam). A recently sequenced population of leaf insect on Halmahera, Indonesia, revealed an undescribed species which, despite being only ca. 45 kilometers away from its phylogenetically revealed sister species, *Phyllium tobeloense* Grösser, 2007, was found to be genetically distinct and have consistent morphological differences between these two populations. Herein, this taxon is described as *Phyllium bankae* **sp**. **nov**. from Mount Ibu, Halmahera Island, Indonesia.

Cumming R.T., Foley E.M. & Le Tirant S., 2025. – *Phyllium bankae* **sp**. **nov**., a new species from Mount Ibu, Indonesia (Phasmatodea: Phylliidae). *Faunitaxys*, 13(30) : 1 – 10.

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Introduction

Phasmatodea, commonly referred to as "stick and leaf insects", "walking sticks", or simply "phasmids," is a clade of more than 3,000 species which almost exclusively mimic botanical features, allowing these herbivorous insects to blend seamlessly into their surroundings, thus avoiding predation (Brock et al., 2025). Most phasmids resemble sticks, bark, or twigs, while in the case of the Phylliidae, or true leaf insects, this clade impressively mimics angiosperm leaves due to their dorso-ventrally flattened abdomen, leaf-like wings, and legs bearing flattened lobes (Brock & Büscher, 2022; Fig. 1). This leaf size and shape habitus, coupled with their botanically derived coloration, results in an impressive leaf-like mimicry (Cumming et al., 2022). At present, over 100 species of leaf insect have been described and they geographically range from the Seychelles in the west, throughout Asia, Australasia, and east into the Pacific (Größer, 2008; Bank et al., 2021; Brock et al., 2025). Morphologically many adult leaf insects look very similar, resulting in their true species diversity being historically overlooked, and only in the last several decades have most species and genera been recognized (Bank et al., 2021; Cumming & Le Tirant 2022). Additionally, there is significant sexual dimorphism (with females broad and flightless (Fig. 1); while males are thin, with long antennae, and fully developed flight wings (Fig. 2)) which has made it exceedingly difficult to identify what may represent the opposite sex of an already described (but poorly known species), versus an undescribed species (Cumming et al., 2020).

Thankfully, in recent years, our understanding of the leaf insects has been greatly advanced by the enthusiastic captive rearing community and by DNA based phylogenetic studies (Hennemann, et al., 2009; Bank et al., 2021). What has been recognized, thanks to the rearing of these insects in captivity, is that despite many adult leaf insects looking very similar, even closely related species can have drastically different egg and freshly hatched nymph morphology, thus allowing easier species differentiation (Cumming et al., 2019; Cumming et al., 2023; Büscher et al., 2023). Additionally, recent molecular studies have been invaluable in clarifying relationships within the Phylliidae, both for genera and species taxonomic descriptions (Cumming et al., 2021; Cumming & Le Tirant, 2022; Bank et al., 2021). The most comprehensive phylogenetic study of leaf insects to date (Bank et al., 2021) has set the groundwork for all subsequent studies, including the herein work. In addition to allowing the clarification of the phylliid genera, Bank et al. (2021) identified numerous

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undescribed species, some of which have since been formally named (Cumming et al., 2023). While Cumming et al., (2023) formally described several species which were covered in Bank et al., (2021), it did not assign names to all therein undescribed species. In order to further clarify the work of Bank et al., (2021), herein we describe the taxon sample from that work "*Phyllium* (*Phyllium*) sp. #2 "Mt. Ibu"" and morphologically differentiate it from congenerics.

Materials and methods

Specimens

Specimens for this study come from museum collections and records from several private collections. Additionally, besides reviewing specimens in person, we also utilized the high-quality images of captive reared specimens available publicly on Phasmatodea.com "The World of Stick Insects" (http://www.phasmatodea.com) as well as many type material images available on "Phasmida Species Files Online" (http://phasmida.speciesfile.org) in order to better understand intraspecific variability presented within species. Measurements of specimens were made to the nearest 0.1 mm using digital calipers and are given for individual specimens. The distribution map (Fig. 3) was produced with SimpleMappr (Shorthouse, 2010).

Holotype and paratype specimens herein designated are deposited within several different institutional and private collections which are explicitly listed within the type material information of the new species descriptions where the following collection acronyms are used:

IMQC: Insectarium de Montréal, Montréal, Québec, Canada
SDEI: Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
Coll FH: Private collection of Frank H. Hennemann, Germany
Coll RC: Private collection of Royce T. Cumming, California, USA
Coll SLT: Private collection of Stéphane Le Tirant, Québec, Canada

Morphological abbreviations (listed morphologically anterior to posterior)

C	costa
Sc	subcosta
R	radius
R1	radius 1
Rs	radial sector
R–M	radius to media crossvein
M	media
MA	media anterior
MP	media posterior
MP1	first media posterior
MP2	second media posterior
M–Cu	media to cubitus crossvein
Cu	cubitus
CuA	cubitus anterior
CuP	cubitus posterior
Cu+1AA	cubitus and first anterior anal
1A	first anal
1AA-7AA	first–seventh anterior anal
1PA-5PA	first–fifth posterior anal

Photography

Photographs of specimens deposited within the IMQC collection were taken by René Limoges using a Nikon D850 DSLR camera (Nikon Corporation, Tokyo, Japan) with Nikon Micro-Nikkor 200mm f/4 lens on Manfrotto 454 micrometric positioning sliding plate (Manfrotto, Casolla, Italy). Lighting was provided by two Nikon SB-25 flash units with a Cameron Digital diffusion photo box (Henry's, Vancouver, Canada). Adobe Photoshop Elements 13 (Adobe Inc., San Jose, USA) was used as post-processing software. Additional photographs which are not from the IMQC are explicitly listed within the figure captions with citation to the photographers.

Taxonomy

Phylliidae, **Phylliinae**, **Phylliini**

Phyllium Illiger, 1798

Type species. – *Phyllium siccifolium* (Linnaeus, 1758)

***Phyllium bankae* sp. nov.**

ZooBank : https://zoobank.org/09B77055-EE8A-47D6-A617-700010D0A053

Holotype, ♀, Indonesia: Halmahera, Mt. Ibu: November 2014; Coll RC #16-184; *Phyllium* sp. 2, See Bank et al. 2021; Commun Biol 4, 932, GenBank Accession #s: MW703276; MW703203; MW686068; MW698890; MW686153; MW703331; [IMQC].

Paratypes (**30** ♀, **19** ♂): Indonesia: Halmahera, Mt. Ibu. See below deposition data for individual data.

Depositions

- **1** ♂, Halmahera, Mt. Ibu [Coll. RC 16-189]
- **1** ♂, Indonesia: Halmahera, Mt. Ibu: January 2015 [Coll. RC 16-208]
- **1** ♂, Indonesia: Halmahera, Mt. Ibu: July 2014 [Coll. RC 16-209]
- **2** ♀, Indonesia: Halmahera, Mt. Ibu: XII,2015, Local Collector [Coll RC; Coll. RC 18-148 and Coll. RC 18-149]
- **1** ♀, **1** ♂, Indonesia: Halmahera, Mt. Ibu, III.2015 [Coll RC; Coll. RC 18-419 and Coll. RC 18-420]
- **2** ♀, Indonesia: Halmahera, Mt. Ibu, March, 2019 [Coll RC; Coll. RC 19-173 and Coll. RC 19-174]
- **6** ♂, Indonesia: Halmahera, Mt. Ibu, Feb-May, 2017 [Coll RC; Coll. RC 19-175 through Coll. RC 19-180]
- **17** ♀, **3** ♂, Indonesia: Halmahera, Mt.Ibu, XII.2015 [Coll. IMQC]
- **7** ♀, **4** ♂, Indonesia: Halmahera, Mt.Ibu, I.2016 [Coll. SLT]
- **1** ♀, **2** ♂, INDONESIEN, Prov. Maluka, Halmahera, Mount Ibu, II.2012, local collector [coll. FH, Numbers: FH-1591-1, FH-1591-2, FH-1591-3].

Etymology. – Patronym; named to honor Sarah Bank (Germany). This species epithet is crafted to thank Sarah for her years of dedication to unraveling the evolutionary history of the Phylliidae. This species was chosen specifically for Sarah because in Indonesian "ibu" can mean "mother"; a role which Sarah has been juggling full-time while also greatly advancing our understanding of leaf insect phylogenetics. Thanks to her countless hours spent working on sequencing and analyzing phylliid genetics within the Sven Bradler lab (Germany), Sarah is without a doubt the "mother of modern phylliid taxonomy".

Discussion. – This species was sequenced and included within the first large-scale phylogeny of the Phylliidae (Bank et al., 2021) as "*Phyllium* (*Phyllium*) sp. 2 "Mt. Ibu"". Within Bank et al. (2021) *Phyllium tobeloense* was represented by two samples, a sample from the leaf insect enthusiast captive rearing community kept in culture as "*Phyllium tobeloense* "Galela"" (Galela is a town in the North Halmahera Regency near the *Phyllium tobeloense* type locality of Tobelo; Fig. 3). Most importantly, the holotype *Phyllium tobeloense* from Tobelo, within the SDEI collection was also sequenced and included within the analyses of Bank et al., (2021). Within the resulting phylogeny the samples from Galela and Tobelo were recovered as the same species (*Phyllium tobeloense*) and "*Phyllium* (*Phyllium*) sp. 2 "Mt. Ibu" was recovered with significant genetic distance as a distinct sister taxon to *Phyllium tobeloense*. At the time of that publication the focus was on large-scale phylogeny, genera differentiation, and biogeography, so the species was not formally described at the time of that work.

While reviewing paratype specimens for this new species, a notable morphological curiosity was observed. One adult female within the IMQC collection has an additional fully developed tibia and tarsus sprouting from one of the metatibia

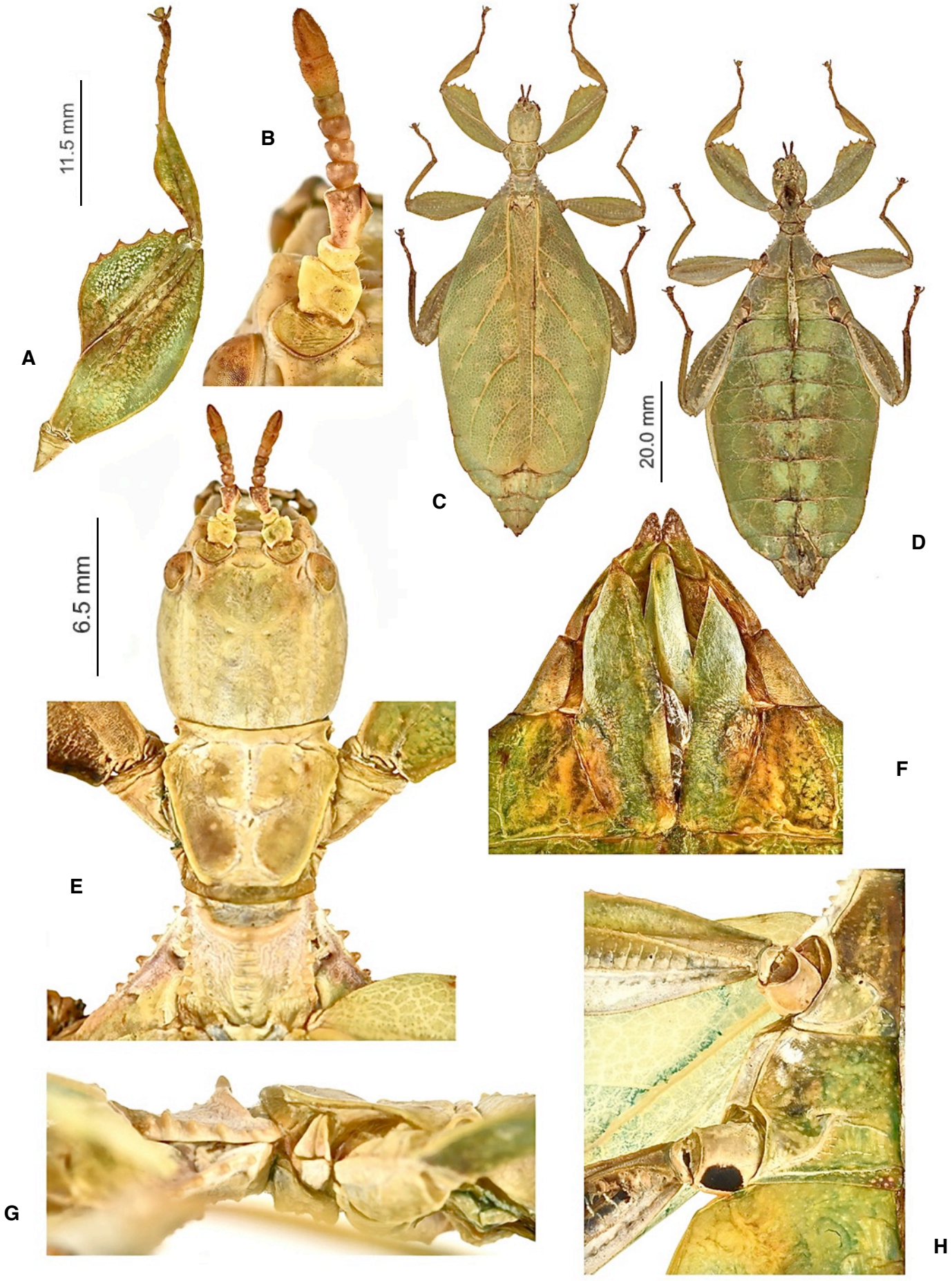

Fig. **1**. *Phyllium bankae* **sp**. **nov**.

C, **D**. Holotype female (Coll RC #16-184; IMQC). **A**, **B**, **E**, **F**, **G**, **H**. Paratype female (IMQC). 20.0 mm scale bar associated with **C**, **D**. **A**. Front right leg, dorsal (11.5 mm scale bar to the left). **B**. Details of antenna, dorsal. **C**. Habitus, dorsal. **D**. Habitus, ventral. **E**. Detail of antennae, head, and, thorax, dorsal (6.5 mm scale bar to the left). **F**. Terminalia, ventral. **G**. Details of the thorax, lateral (anterior to the right). **H**. Meso- and metacoxae, ventral.

(Fig. 4). For an individual to reach adulthood with such an aberration is highly unlikely within phylliids due to their somewhat delicate molting process and high propensity for autotomy (Bradler & Buckley, 2018).

Differentiation. – Female *Phyllium bankae* **sp**. **nov**. are morphologically most similar to *Phyllium tobeloense tobeloense* Größer, 2008 and *Phyllium tobeloense bhaskarai* Cumming et al., 2019 due to general femoral lobe shape/size/spination, tegmina length and venation, and ventral coloration of the meso- and metacoxae. Females of these three taxa are very difficult to morphologically differentiate, and from review of series of variable specimens of all three taxa, few features were identified as consistently useful for differentiation of female *Phyllium bankae* **sp**. **nov**. from *Phyllium tobeloense tobeloense* and *Phyllium tobeloense bhaskarai*. The only feature thus far identified as partially useful is the subgenital plate length. Female *Phyllium bankae* **sp**. **nov**. can be differentiated from *Phyllium tobeloense tobeloense* by the longer subgenital plate in *Phyllium bankae* **sp**. **nov**. (which is similar in length to *Phyllium tobeloense bhaskarai* which reaches only ca. three-quarter the length of sternite X, leaving only the tips of the gonapophyses exposed) versus the shorter subgenital plate of *Phyllium tobeloense tobeloense* which reaches ca. half the length of sternite X, leaving more of the gonapophyses exposed. Beyond that consistent feature allowing two of the three taxa to be differentiated, no consistent feature has been identified to differentiate *Phyllium bankae* **sp**. **nov**. females from *Phyllium tobeloense tobeloense* females. Thankfully the males are consistently more useful for morphological differentiation.

Male *Phyllium bankae* **sp**. **nov**. are morphologically most similar to *Phyllium tobeloense tobeloense* and *Phyllium tobeloense bhaskarai* due to thorax shape and spination, forewing length and venation, and general abdomen shape/size. Male *Phyllium bankae* **sp**. **nov**. can be differentiated from both taxa by their notably narrower protibial interior lobes, which are only about as wide as the protibial shaft itself (Fig. 2), versus the other taxa which have broader lobes, greater in width than the protibial shaft. Male *Phyllium bankae* **sp**. **nov**. also appear to consistently have shorter antennae (when laid dorsally along the body reaching only onto abdominal segment II), versus the antennae of *Phyllium tobeloense tobeloense* which reach onto abdominal segment III. Due to morphological variability, no additional features have been identified as reliable and consistent for differentiation of males.

Unfortunately, this new species has not yet entered the leaf insect enthusiast captive rearing community, therefore the eggs and fresh hatched nymphs are currently unknown. While adult leaf insects look very similar, oftentimes the freshly hatched nymphs or egg morphology allow consistent and easy differentiation, even for closely related species (Cumming et al., 2023). Egg morphology was the primary feature used for the differentiation of *Phyllium tobeloense tobeloense* and *Phyllium tobeloense bhaskarai* as the nominate subspecies has reniform eggs while the subspecies from Morotai Island has ovoid eggs (Cumming et al., 2019). Hopefully someday *Phyllium bankae* **sp**. **nov**. will enter the rearing community stock and the eggs and fresh hatched nymphs can be reviewed. At the moment, due to our incomplete knowledge on *Phyllium bankae* **sp**. **nov**. morphology for all life stages, the most reliable feature for differentiation is the DNA which has been found to be significantly different from congenerics (Bank et al., 2021).

Distribution. – At present known from the type locality of Mount Ibu (Gunung Ibu), West Halmahera Regency, North Maluku Province, Indonesia (Fig. 3).

Description

Female

Coloration. – Coloration description is based upon the type material, which is dead and dried reasonably well (not too many dark rotten areas; Fig. 1). We unfortunately do not have any images of living specimens to give further details on coloration. The general coloration is pale green throughout (although some areas have faded to yellow such as the tegmina veins and the compound eyes, likely due to the drying process). Throughout the paratype series there is little variable coloration sometimes seen on *Phyllium* species. This species appears to be prominently green with few if any brown/tan markings, at most sometimes the profemoral interior lobe teeth can be slightly brown/orange. Ventrally, the mesocoxae are somewhat yellow/tan/orange and contrast greatly with the metacoxae which have a distinct dark gray/black marking on them (Fig. 1H).

Morphology

Head. – Capsule slightly longer than wide, with a vertex that is relatively smooth, only a few low, broad, nodes on the posterior half (Fig. 1E). The posteromedial tubercle is present, singularly lobed, but not very prominent (Fig. 1E). Frontal convexity broad and ending in a blunted, but narrow point. Compound eyes only slightly protruding from the head capsule, taking up ca. ¼ of the head capsule lateral margins (Fig. 1E). Ocelli absent. Antennal fields slightly wider than the first antennomere width.

Antennae. – Consist of nine segments, with the terminal two segments similar lengths and widths, and both covered intermediately with short, dark setae (Fig. 1B). Antennomeres I-VII have fewer setae, fewer dark ones, and most are lighter colored and less visible. Antennomeres IV-VII are nearly uniform in size and shape.

Thorax. – Pronotum with slightly concave anterior margin and lateral margins that angle inward slightly with straight margins, to the posterior which is ca. ⅗ the width of the anterior margin (Fig. 1E). The pronotum anterior and lateral margins have prominent rims, while the posterior margin is weakly formed. The pronotum surface is relatively smooth except for a few small, barely raised nodes. Most prominent on the pronotum surface is a pit in the center and a few furrows lateral and anterior to the central pit; posterior of the pit is a distinct, but shallow groove (Fig. 1E). Prosternum, mesosternum, and metasternum are covered throughout by irregularly spaced nodes, all relatively smooth, but more prominent than any nodes of the dorsal surface (Fig. 1E). Praescutum approximately as long as wide, lateral rims with six or seven prominent, bulbous nodes (Fig. 1E). Praescutum anterior rim distinct and prominently raised into a broad sagittal spine (Fig. 1G). Praescutum surface somewhat wrinkled and marked with a slightly raised sagittal crest which is marked with four or five granules along the sagittal plane (none very prominent; Fig. 1E). Mesopleurae begin on the anterior margin, angle prominently away with nearly straight margins (Fig. 1E). Mesopleurae lateral margins with four or five prominent, rounded tubercles, and two or three minor tubercles interspersed (Fig. 1E). Face of the mesopleura slightly wrinkled, with two notable divots, one on the anterior margin and one near the middle (Fig. 1E).

Wings. – Tegmina long, reaching onto abdominal segment VIII (with slight variation among paratypes with how far onto the segment the tegmina goes). Tegmina venation (Fig. 5A); the subcosta (Sc) is the first vein in the forewing, running parallel with the margin for the first half, and then bending and running towards the margin and terminating there ca. ⅓ of the way through the wing length. The radius (R) spans the central portion of the forewing with two subparallel branched veins; the first radius (R1) branches ca. ¼ of the way through the wing length and terminates slightly proximal to the midline; the radial sector (Rs) runs throughout most of the wing length, arcing across the surface and terminates near the distal ⅓ of the wing length. There is a weak continuation of the radius following the prominent Rs branching which continues on as a short but distinct R–M crossvein, but this crossvein does not appear to fully connect the two veins. The media (M) is bifurcate with both the media anterior (MA) and media posterior (MP) terminating near to the posterior ¼ of the tegmina. The cubitus (Cu) is also bifurcate, branching near the posterior ⅛ of the wing into the cubitus anterior (CuA) and cubitus posterior (CuP)

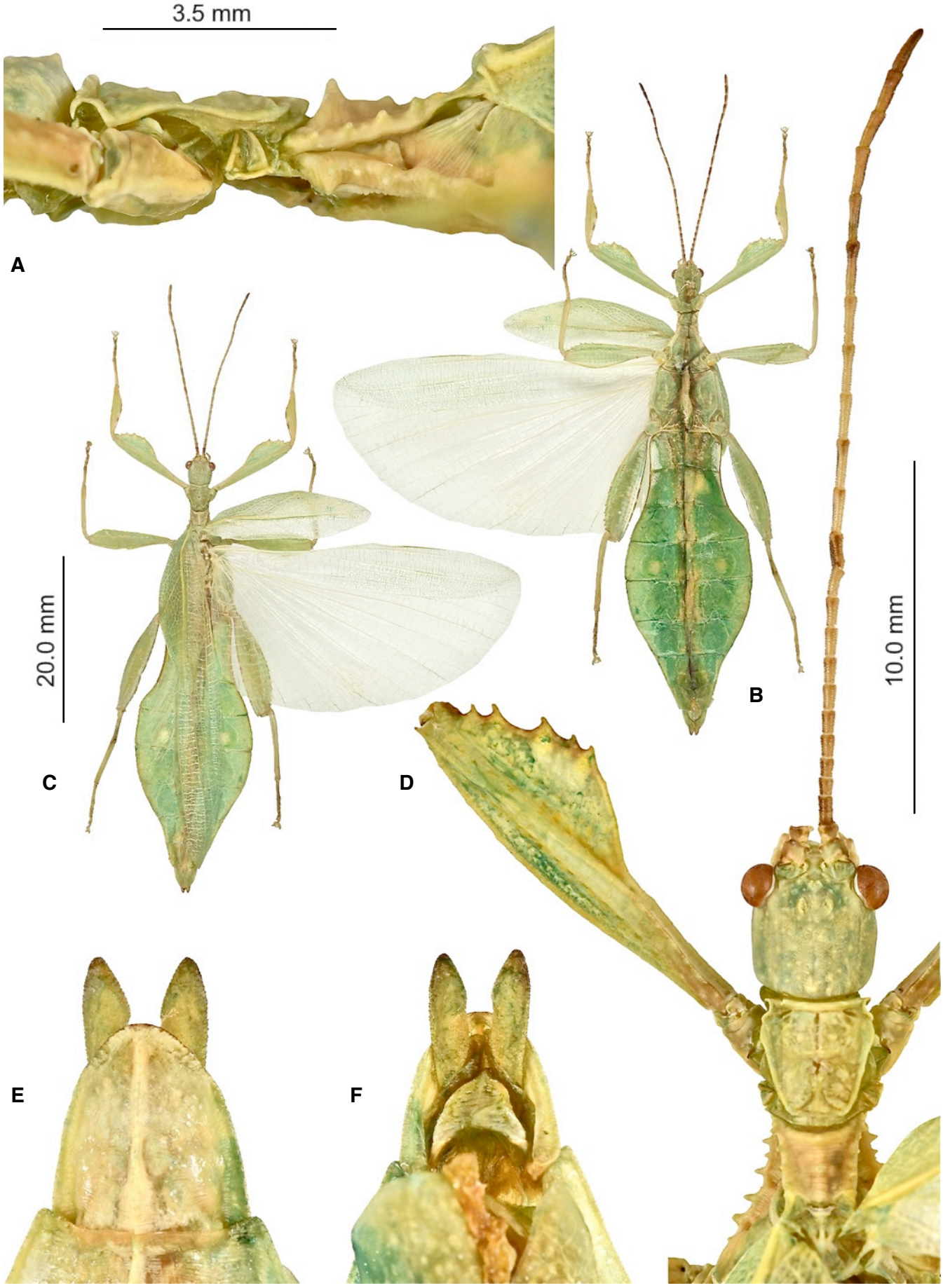

Fig. **2**. *Phyllium bankae* **sp**. **nov**. paratype males.

A, **D**, **E**, **F**. Paratype [IMQC]. **B**, **C**. Paratype [Coll RC #16-189]. 20.0 mm scale bar associated with **B**, **C**.

A. Thorax, lateral, anterior to the left (3.5 mm scale bar above). **B**. Habitus, ventral. **C**. Habitus, dorsal. **D**. Detail of profemora, head, and antenna, dorsal (10.0 mm scale bar to the right). **E**. Terminalia, dorsal. **F**. Terminalia, ventral.

which both terminate near the wing apex (both the CuP and CuA are notably thinner than the remainder of the Cu). The first anal vein (1A) is simple and fuses with the cubitus approximately ¼ of the way through the tegmina length. Alae vestigial, with their apex only just reaching abdominal tergite I.

Abdomen. – Abdominal segments II through the anterior ⅔ of IV prominently and uniformly diverging. The posterior ⅓ of segment IV through the anterior ½ of segment VII are gradually and uniformly converging. The posterior ½ of segment VII is rounded inwards towards segment VIII. Segments VIII-X converging with a slight undulation, margins not perfectly straight, ending in a broad rounded apex.

Genitalia. – Subgenital plate starts at the anterior margin of tergum VIII, is broad, and extends most of the way onto tergum X. The apical fifth of the subgenital plate is slightly narrower than the previous width, and the apex is a fine point (Fig. 1F). Gonapophyses VIII are long and moderately broad with straight margins, reaching the apex of abdominal tergum X; gonapophyses IX are smaller and obstructed from view (Fig. 1F). Cerci flat, slightly broadening to the apical ⅓, and marked throughout with a finely granular surface (Fig. 1F).

Legs. – Profemoral exterior lobe broad and rounded (greatest width slightly thinner than two times the profemoral shaft greatest width), slightly wider than the width of the interior lobe (Fig. 1A). Throughout the margin of the profemoral exterior lobe is widely spaced, weakly formed nodes, with the central three or four slightly more prominent and weakly formed into small, serrate teeth. Profemoral interior lobe ca. 1.5× as wide as the greatest width of the profemoral shaft, obtusely angled, and marked with five or six distally pointing, prominent, serrate teeth; most are relatively evenly spaced, but can occasionally have a wider looping gap between some (Fig. 1A). Mesofemoral lobes arc from end to end; the interior lobe and the exterior lobes are similar widths (each slightly wider than the greatest width of the mesofemoral shaft). The mesofemoral interior lobe is marked with seven small, serrate teeth on the distal half only; the exterior lobe is marked with a single small tooth located on the distal ⅓ of the lobe. Metafemoral interior lobe arcs end to end, with the distal half slightly wider than the proximal half and marked with nine or ten serrate teeth on the distal ⅜ of the lobe. Metafemoral exterior lobe lacks dentation and has a width slightly narrower than the metafemoral shaft width. Protibiae exterior lacking notable features (Fig. 1A). Protibiae interior lobe spans the entire length of the protibiae and at its widest is only slightly wider than the protibial shaft thickness. The lobe is a rounded, thin triangle with the widest portion near the midlength. Mesotibiae and metatibiae simple, lacking exterior and interior lobes.

Measurements of holotype female (mm)

Body length (including cerci and head, excluding antennae): 90.3,
Length/width of head: 8.7/7.3,
Antennae: 6.3,
Pronotum: 6.6,
Mesonotum: 8.2,
Length of tegmina: 58.6,
Greatest width of abdomen: 35.2,
Profemora: 18.1,
Mesofemora: 17.5,
Metafemora: 20.9,
Protibia: 11.7,
Mesotibia: 11.7,
Metatibia: 15.8.

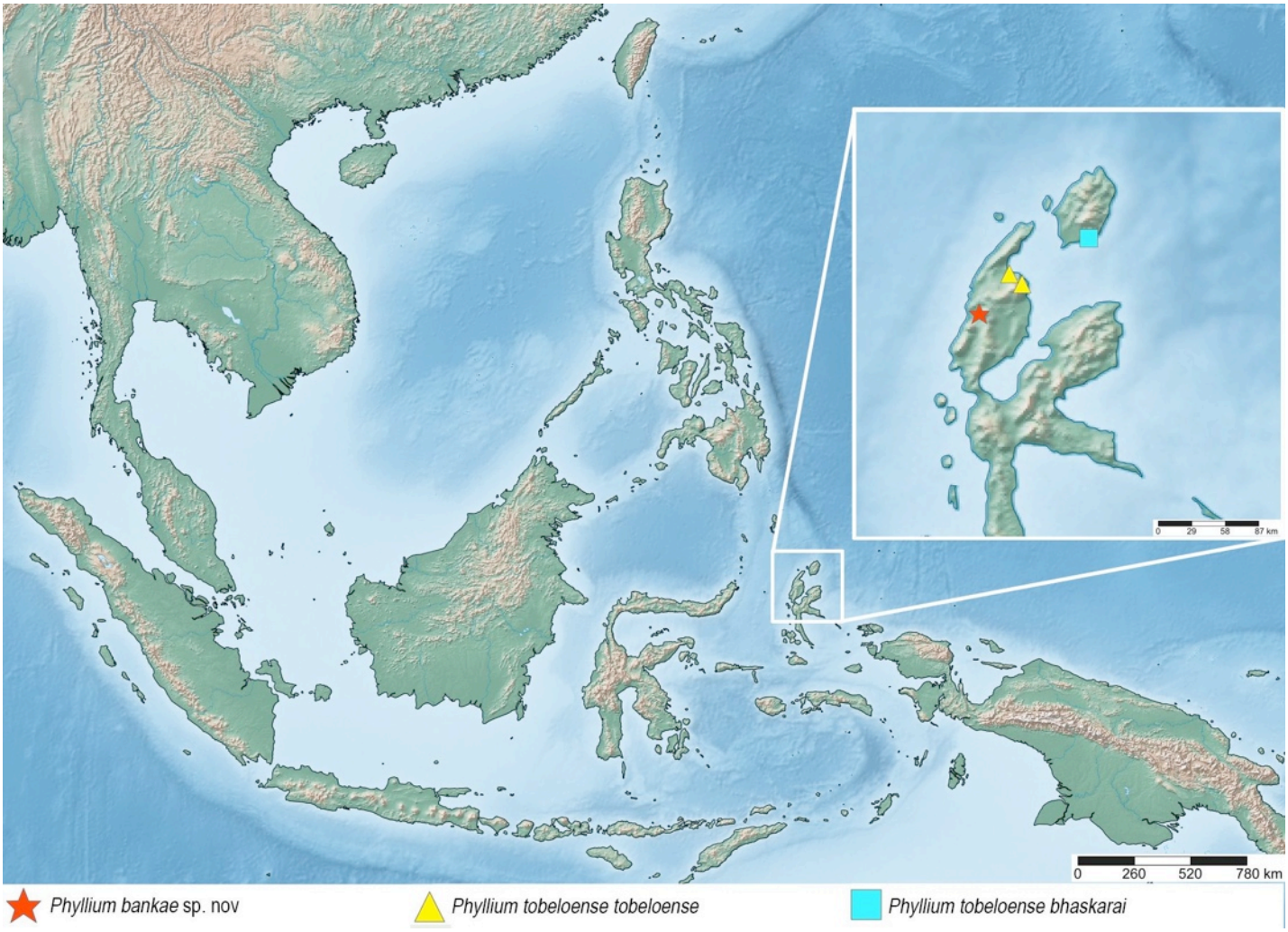

Fig. **3**. Distribution map for *Phyllium tobeloense* and *Phyllium bankae* **sp**. **nov**. Inset shows a closer view of northern Halmahera and Morotai Island

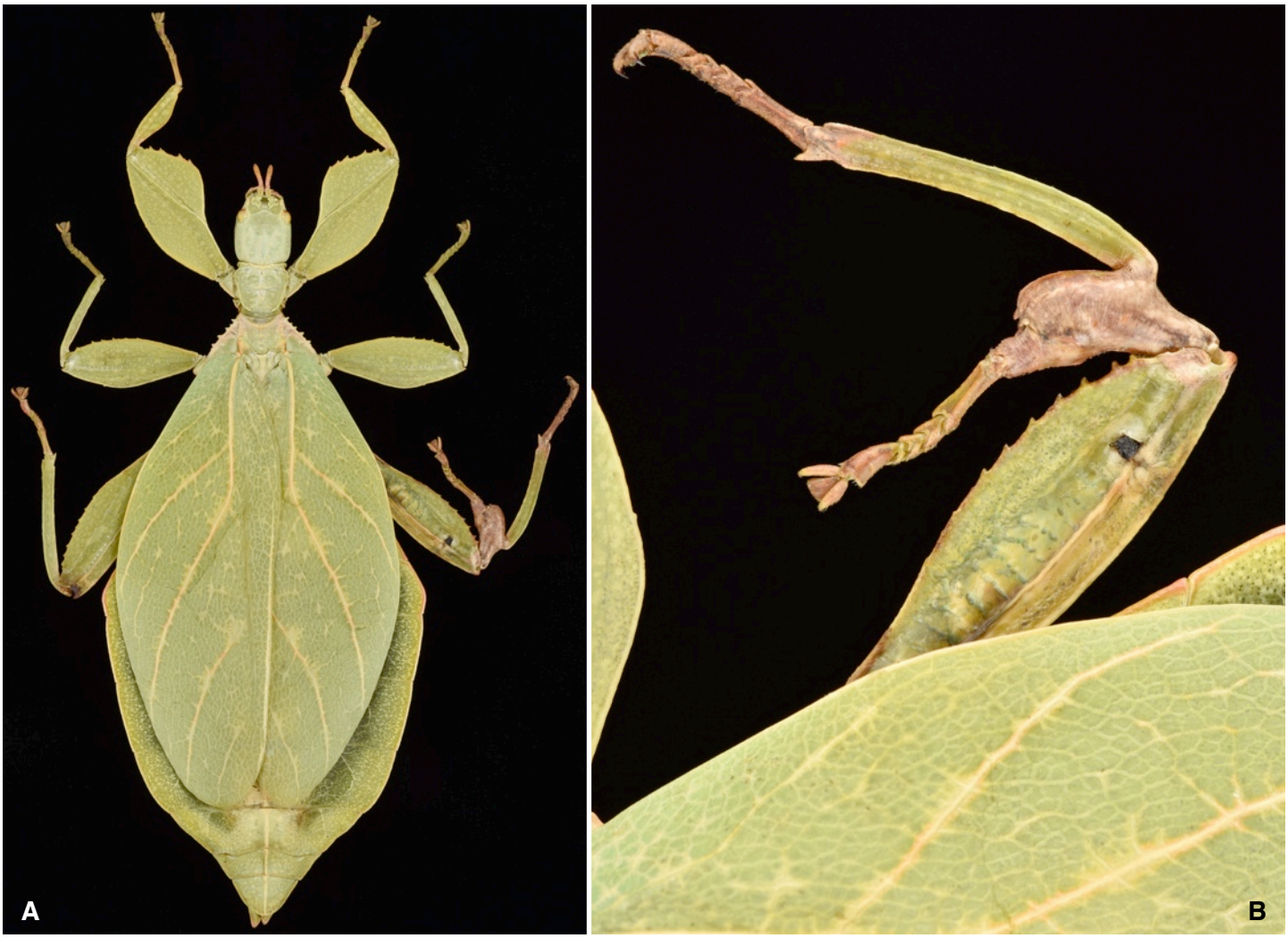

Fig. **4**. *Phyllium bankae* **sp**. **nov**. paratype female (IMQC), seven-legged aberration.

A. Dorsal habitus. **B**. Detail of the metatibia with the abnormality, dorsal.

Measurements of paratype females (mm)

Body length (including cerci and head, excluding antennae): 89.6–94.2,
Length/width of head: 8.5-10.0/7.2-7.8,
Antennae: 5.8-6.4,
Pronotum: 6.2-6.7,
Mesonotum: 7.5-8.4,
Length of tegmina: 58.3-62.3,
Greatest width of abdomen: 34.9-40.1,
Profemora: 18.0-19.8,
Mesofemora: 17.2-17.5,
Metafemora: 20.8-23.4,
Protibiae: 11.5-12.0,
Mesotibiae: 11.6-12.3,
Metatibiae: 15.7-18.5.

Male

Coloration. – Coloration based upon the dead, dried type material (Fig. 2). Likely when alive the colors were more vibrant, with less yellow fading. Overall coloration pale green throughout with highlights of tan/reddish coloration. Tan/brown areas are primarily the thorax, antennae, and margins of the femora. The compound eyes are red. Abdominal segment V has a pair of transparent eye spots. Ventral mesocoxae coloration is white yellow, metacoxae coloration paler, more cream in color.

Morphology

Head. – Capsule slightly longer than wide, with a vertex that is marked throughout with distinct nodes which are relatively uniform in size and spacing (Fig. 2D). The posteromedial tubercle is singularly pointed and distinctly raised above the head capsule (Fig. 2A, D). Frontal convexities stout and bluntly pointed with sparse setae. Compound eyes large and bulbous, occupying ca. ⅔ of the head capsule lateral margins (Fig. 2D). There are three well-developed ocelli distinctly raised above the capsule and located between the compound eyes (Fig. 2D).

Antennae. – Antennae (including the scapus and pedicellus) consist of 25 segments, all segments (except the scapus and pedicellus) are covered in dark, dense, short setae (Fig. 2D). The scapus and pedicellus are nearly bare, at most only a couple pale setae.

Thorax. – Pronotum with anterior margin that is slightly concave and lateral margins that are relatively straight and converging to a straight posterior margin that is ca. ½ the width of the anterior margin (Fig. 2D). Anterior and lateral margins of the pronotum have distinct rims and the posterior margin has a weakly formed rim (Fig. 2D). Face of the pronotum is marked by a distinct pit in the center, a sagittal furrow on the anterior ½, and slight perpendicular furrows originating from the central pit. The pronotum surface is slightly lumpy and lacking distinct granulation (Fig. 2D). Prosternum surface marked throughout with small nodes (Fig. 2D). Mesosternum surface distinctly wrinkled and marked throughout with granulation, with the granulation on the posterior ½ more prominent (Fig. 2D). Metasternum surface wrinkled throughout, and the posterior central area is additionally marked with granulation. Prescutum ca. as long as wide, with lateral margins that converge slightly to the posterior margin which is only slightly narrower than the anterior margin (Fig. 2D). Lateral margins of the prescutum with five or six small, but distinctly formed tubercles of approximately uniform size (Fig. 2D). Prescutum surface slightly raised along the sagittal plane and marked with a singular tubercle near the center and the remainder of the surface is somewhat wrinkled (Fig. 2A, D). Prescutum anterior rim well-formed with a distinct sagittal spine, and the remainder of the rim surface is relatively smooth (Fig. 2A, D). Mesopleurae begin on the anterior prescutum margin and diverge at a gradually increasing angle from the anterior to the posterior but are never notably wide throughout their length (Fig. 2D).

Mesopleuron lateral margin with five or six distinct spiniform tubercles and a few small nodes interspersed throughout (Fig. 2D). Mesopleuron face is moderately wrinkled and marked by a distinct pit near the center and another pit near the posterior margin.

Wings (Fig. 5B, C). – Tegmina moderate length, reaching the anterior margin of abdominal segment IV. Tegmina wing venation: the subcosta (Sc) is the first vein, is simple, and terminates ca. ⅖ of the way through the overall tegmina length. The radius (R) spans the entire length of the tegmina with the first radius (R1) branching slightly less than ⅓ of the way through the tegmina length and angling towards the margin where it terminates slightly more than halfway through the tegmina length, followed by the radial sector running straight to the wing apex. The media (M) also spans the entire length of the tegmen running side by side along the radius/radial sector with the first media posterior (MP1) branching off ca. ⅖ of the way through the overall tegmina length, followed by a second media posterior (MP2) which branches near the middle of the tegmina length and both the MP1 and MP2 run angled towards the apex/cubitus, and the media anterior (MA) runs straight to the tegmen apex. The cubitus (Cu) cuts across the tegmen to the margin ca. ⅓ of the way through the length and runs along the edge of the wing where the first media posterior vein fuses with it and as the cubitus reaches the apex it fades. The first anal (1A) vein terminates upon reaching the cubitus ca. ⅓ of the way through the tegmen length. Alae well-developed in an oval fan configuration, long, reaching slightly onto abdominal segment IX. Ala wing venation: the costa (C) is present along the entire foremargin giving stability to the wing. The subcosta (Sc) is short, spanning ca. ⅓ of the wing length and is mostly fused with the radius near the base of the wing but terminates when it meets the costa. The radius (R) spans the entire wing and branches ca. ⅓ of the way through the wing length into the first radius (R1) and radial sector (Rs) which run gently diverging for ca. ⅓ of their length, then run parallel until they near the apex of the ala where they begin to converge slightly but they terminate at the margin near each other but not touching. The media (M) branches early, ca. 1/7 of the way through the ala length into the media anterior (MA) and the media posterior (MP) which run parallel with each other throughout the wing until the distal ¼ where they taper off and fade. The cubitus (Cu) runs unbranched and terminates at the wing apex. Of the anterior anal veins, the first anterior anal (1AA) fuses with the cubitus ca. ¼ of the way through the wing length then the first anterior anal branches from the cubitus ⅔ of the way through the ala length where it uniformly diverges from the cubitus until it terminates at the wing margin. The anterior anal veins two–seven (2AA-7AA) have a common origin and run unbranched in a folding fan pattern to the wing margin. The posterior anal veins (1PA-6PA) share a common origin separate from the anterior anal veins and run unbranched to the wing margin with slightly thinner spacing than the anterior anal veins.

Abdomen. – Lateral margins of abdominal segment II and III diverging slightly, IV diverging at a more prominent angle to the widest point, V parallel sided, VI through X converging gradually with smooth margins, giving the abdomen a spade-shaped appearance.

Genitalia. – Poculum broad and ends in an apex that slightly passes the anterior margin of the abdominal segment X with a margin that is straight (Fig. 2F). Cerci long and slender, with ca. ½ of their length extending from under abdominal segment X; nearly flat, with straight lateral margins. Surface of the cerci are slightly granular and marked with a few short setae and the lateral margins have slightly more prominent setae and are densely packed (Fig. 2E). Vomer broad and stout with rounded converging, rounded margins to the apical hook which is thick and has a singular point (Fig. 2F).

Legs. – The profemoral exterior lobe is narrow, approximately the same width as the profemoral shaft at its widest. The profemoral exterior lobe margin is slightly granular and on the distal ⅓ there are two or three weakly formed nodes (Fig. 2D). The profemoral interior lobe is obtusely triangular and at its greatest width it is ca. 2× the greatest width of the profemoral shaft. The profemoral interior lobe is ornamented on the distal 1⁄2 with five serrate teeth arranged in a three-two pattern with looping gaps between them, where the central two teeth are slightly larger than the proximal and distal most teeth (Fig. 2D). Mesofemoral exterior lobe arcs end to end but is slightly wider on the distal ½; ca. ⅓ of the way through the length is a singular, distinct tooth; and the proximal ½ of the lobe is rather thin and lacks teeth. Mesofemoral interior lobe, exterior lobe, and mesofemoral shaft are all approximately the same width. The mesofemoral interior lobe, is also slightly broader on the distal end which is nearly straight and the distal end is ornamented with six or seven small serrate teeth while the proximal ½ of the lobe is thin and lacks teeth. Metafemoral exterior lobe lacks dentition and has a straight margin along the metafemoral shaft. Metafemoral interior lobe smoothly arcs end to end with eight or nine sharply serrate teeth on the distal ⅗, which is slightly wider than the smooth proximal portion of the lobe. Protibiae lacking exterior lobe, interior lobe reaching end to end in a rounded triangle with the widest portion near the middle and at its widest the lobe is ca. as wide as the protibial shaft width. Meso- and metatibiae simple, lacking lobes completely. The probasitarsus is ca. ⅗ of the protibial shaft length; the mesobasitarsus is slightly less than ½ of the mesotarsus shaft length; and the metabasitarsus is ca. ⅓ of the metatibial shaft length.

Measurements of paratype males (mm)

Length of body (including cerci and head, excluding antennae): 58.2-61.5,
Length/width of head: 4.0-4.5/3.4-3.5,
Antennae: 22.8-25.9,
Pronotum: 3.3-3.8,
Mesonotum: 4.3-5.0,
Length of tegmina: 19.8-23.1,
Length of alae: 41.8-45.7,
Greatest width of abdomen: 14.4-17.1,
Profemora: 11.8-12.4,
Mesofemora: 10.5-11.4,
Metafemora: 12.9-15.1,
Protibiae: 7.4-8.1,
Mesotibiae: 7.3-8.1,
Metatibiae: 10.1-11.0.

Discussion

The discovery and description of *Phyllium bankae* **sp**. **nov**. from Mount Ibu, Halmahera, Indonesia, emphasizes the continuing importance of holistic taxonomic approaches in uncovering diversity within the Phylliidae. Despite the close geographic proximity of *Phyllium bankae* **sp**. **nov**. to *Phyllium tobeloense* (a distance of only ca. 45 kilometers away), the distinct genetic and morphological traits of this new species highlight how even slight geographic barriers can drive significant evolutionary divergence in leaf insects. As molecular phylogenies continue to expand and more populations are sequenced, it becomes increasingly clear that the diversity of leaf insects in Southeast Asia remains underexplored. This work contributes to a growing body of evidence supporting high levels of endemism in the region, emphasizing the need for continued fieldwork, molecular analysis, and taxonomic revision to fully document and conserve this remarkable lineage of botanical mimics.

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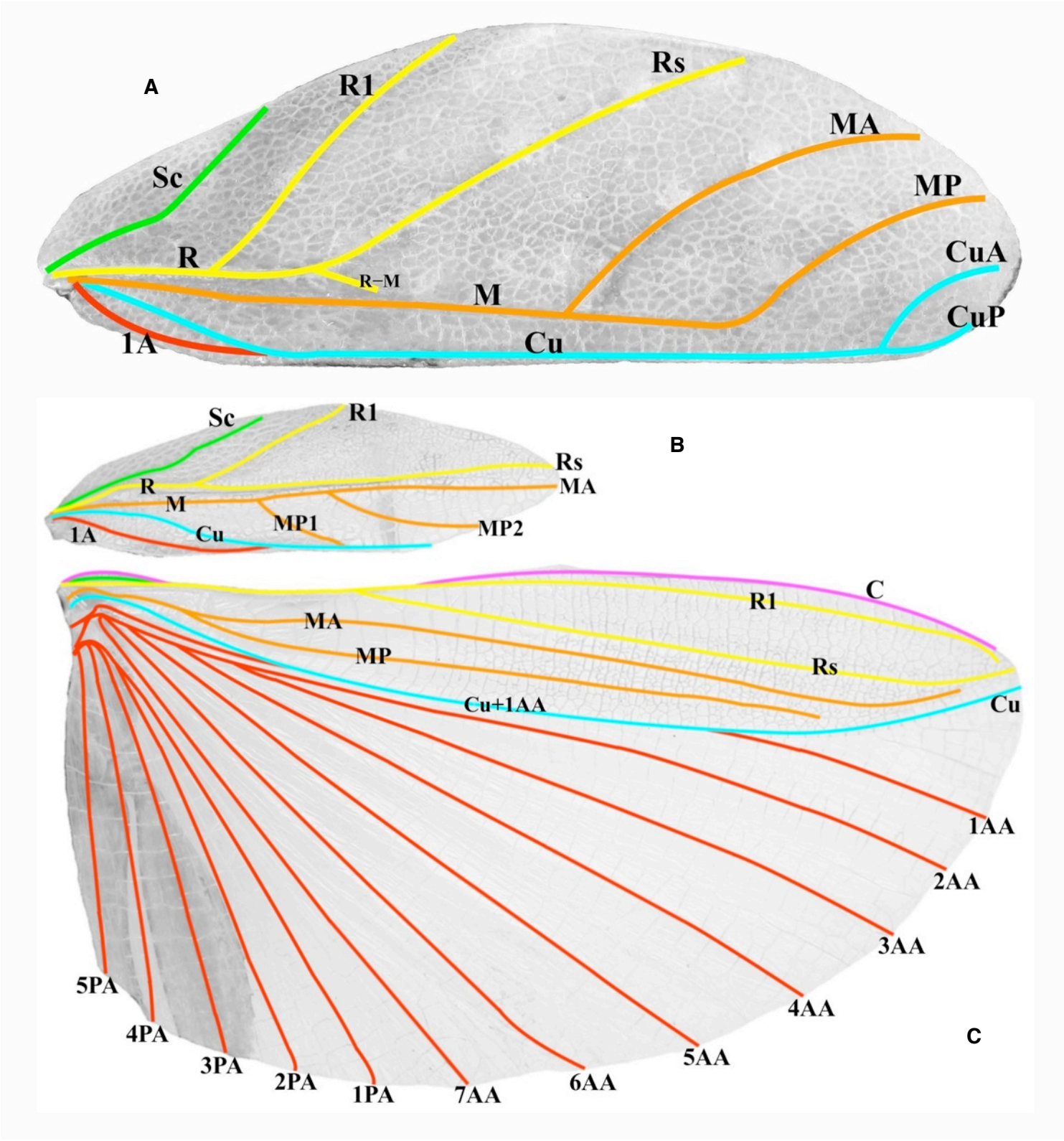

Fig. **5**. Wing venation.

A. Holotype female tegmen (Coll RC #16-184; IMQC). **B**, **C.** Paratype male (Coll RC #16-189). **B**. Tegmen. **C**. Ala. (**B** and **C** scaled to relative size).

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Description. – RTC
Article proofreading. – RTC, EMF & SLT
Bibliographic work. – RTC
Material study. – RTC
Author of the figures. – RTC & EMF

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Résumé

Cumming R.T., Foley E.M. & Le Tirant S., 2025. – *Phyllium bankae* **n**. **sp**. du Mont Ibu, Indonésie (Phasmatodea: Phylliidae). *Faunitaxys*, 13(30) : 1 – 10.

La majorité des espèces d'insectes feuilles (Phylliidae : Phasmatodea) décrites ayant été séquencées et incluses dans la phylogénie basées sur l'ADN, y compris de nombreux holotypes, ont permis de mieux comprendre la distribution géographique des espèces. Ces récents progrès ont révélé que certaines espèces peuvent être largement répandues, par exemple sur plusieurs îles des Philippines ou sur des centaines de kilomètres en Thaïlande, au Laos et en Malaisie. Au contraire, certaines espèces se sont révélées plutôt endémiques, ne se trouvant que sur des îles uniquement (comme de nombreuses espèces en Indonésie) ou sur des montagnes (comme dans le sud du Viêt Nam). Une population d'insectes feuilles récemment séquencée de Halmahera, en Indonésie, a révélé être une espèce non décrite qui, bien qu'elle ne se trouve qu'à environ 45 kilomètres de son espèce sœur phylogénétiquement reliée, *Phyllium tobeloense* Grösser, 2007, s'est avérée génétiquement distincte et présente des différences morphologiques constantes entre ces deux populations. Ce taxon est donc décrit comme *Phyllium bankae* **n**. **sp**. du mont Ibu, de l'île de Halmahera, Indonésie.

Mots-clés. – Phasmatodea, Phasmida, Phylliidae, *Phyllium*, *bankae*, insecte feuille, taxonomie, description, nouvelle espèce, Ile de Halmahera, Indonésie.

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Illustration de la couverture :
Halmahera Island tropical Forest, Indonesia (Alamy).

Crédits:

René Limoges : Fig. 1 A-H, 2 A-F, 4 A-B
Royce T. **Cumming** : Fig. 5-A-C
Evelyn Marie Foley : Fig. 3

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